



## Goddard Procedural Requirements (GPR)

DIRECTIVE NO.	<u>GPR 1860.3</u>	APPROVED BY Signature:	<u>Original Signed by</u>
EFFECTIVE DATE:	<u>February 15, 2005</u>	NAME:	<u>Edward J. Weiler</u>
EXPIRATION DATE:	<u>February 15, 2010</u>	TITLE:	<u>Director</u>

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### COMPLIANCE IS MANDATORY

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**Responsible Office:** 250 / Safety and Environmental (S&E) Division

**Title:** Radio Frequency Radiation Safety

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## PREFACE

### P.1 PURPOSE

This document sets forth the Goddard Space Flight Center's (GSFC) radiation protection program for radio frequency (RF) and electromagnetic field (EMF) radiation and contains administrative direction and guidance on organizational and procedural requirements. This document also provides essential RF and EMF radiation protection information. Only RF and EMF radiation is covered in this guide; other types of radiation are covered in other documents.

### P.2 APPLICABILITY

These requirements are applicable to all GSFC personnel, facilities, and activities, including all permanent and temporary sites. These requirements also apply to all GSFC tenant organizations, contractors, grantees, clubs and other persons operating on GSFC property as required by law and as directed by contractual, grant, and agreement documents.

### P.3 AUTHORITY

- [NPD 8710.2](#), NASA Safety and Health Program Policy
- National Aeronautics and Space Act of 1958 as amended {42 U.S.C. §§2451-2484}.

### P.4 REFERENCES

- Institute of Electrical and Electronics Engineers (IEEE) for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3kHz to 300 GHz (IEEE C95.1)
- RF Warning Sign (American National Standards Institute (ANSI) C95.2)
- American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Values (TLVs) for Chemical Substances and Physical Agents and Biological Exposure Indices (BEIs), latest edition.
- Occupational Safety and Health Act of 1970
- [GSFC Form 23-6RF](#), Request for Radiation Safety Committee Action – Non-Ionizing Radiation Source (RF/EMF) Use Approval
- [GSFC Form 23-28RF](#), Request for Radiation Safety Committee Action – RF/Microwave Source Questionnaire

CHECK THE GSFC DIRECTIVES MANAGEMENT SYSTEM AT  
<http://gdms.gsfc.nasa.gov> TO VERIFY THAT THIS IS THE CORRECT VERSION PRIOR TO USE.

- g. [GSFC Form 23-35RF](#), Request for Radiation Safety Committee Action – Non-Ionizing Radiation Personnel Approval

## **P.5 CANCELLATION**

GHB 1860.2, Radio-Frequency Radiation Safety Handbook, May 1976.

## **P.6 SAFETY**

Safety procedures shall be identified in GSFC Form 23-6RF (See paragraph 2.3)

## **P.7 TRAINING**

N/A

## **P.8 RECORDS**

<b>Record Title</b>	<b>Record Custodian</b>	<b>Retention</b>
Request for Radiation Safety Committee Action – Non-Ionizing Radiation Source (RF/EMF) Use Approval (GSFC Form 23-6RF)	Safety and Environmental Division, Radiation Protection Officer	* <a href="#">NRRS 1-124</a> . Transfer to Federal Records Center (FRC) when 3 years old. Destroy 10 years after transfer.
Request for Radiation Safety Committee Action – Non-Ionizing Radiation Personnel Approval (GSFC Form 23-35RF)	Safety and Environmental Division, Radiation Protection Officer	* <a href="#">NRRS 1-124</a>
Request for Radiation Safety Committee Action – RF-Microwave Source Questionnaire (GSFC Form 23-28RF)	Safety and Environmental Division, Radiation Protection Officer	<a href="#">NRRS 1-124</a> .

\*NRRS - NASA Records Retention Schedules ([NPR 1441.1](#))

## **P.9 METRICS**

Metrics shall include the number of harmful employee exposures and the number of RF incidents, and shall be reported quarterly to the RSC by the RPO.

## **P.10 DEFINITIONS**

**Custodian** – Any user who has been designated by the appropriate management and approved by the RSC to assume the responsibility of accountability for specific sources of RF/EMF radiation.

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**User** – Any employee or contractor who has been approved by management to use specific sources and devices that emit RF/EMF radiation for specific purposes and at specific locations.

## P.11 ACRONYMS

ACGIH – American Conference of Governmental Industrial Hygienists  
ALARA – As Low As Reasonably Achievable  
ANSI – American National Standards Institute  
BEI – Biological Exposure Index  
EA – Environmental Assessment  
EED – electro-explosive device  
EMF – electromagnetic field  
FCC – Federal Communications Commission  
GSC – Goddard Safety Council  
GSFC – Goddard Space Flight Center  
IEEE – Institute of Electrical and Electronics Engineers  
NRPO – Non-ionizing Radiation Protection Officer  
NTIA – National Telecommunications and Information Administration  
OJT – On the job training  
PEL – Permissible Exposure Limit  
PG – Protection Guide  
PPE – personal protective equipment  
RCA – Radiation Control Area  
RF – radio frequency  
RPO – Radiation Protection Officer  
RSC – Radiation Safety Committee  
S&E – Safety and Environmental Division  
SMC – Safety Management Council  
TLV – Threshold Limit Value  
WFF – Wallops Flight Facility

## PROCEDURES

In this document, a requirement is identified by “shall,” a good practice by “should,” permission by “may” or “can,” expectation by “will,” and descriptive material by “is.”

### 1. RESPONSIBILITIES

**1.1 Goddard Safety Council (GSC)** – The GSC is responsible to the Director, GSFC, for overseeing development, direction, and implementation of GSFC’s Health and Safety Program, including radiation protection.

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## 1.2 Radiation Safety Committee (RSC)

The RSC is responsible to the GSC for overseeing development, direction and implementation of the GSFC Radiation Protection Program. The RSC shall evaluate requests for committee action and, if satisfied that safe use shall be made of the sources, shall approve users, custodians and uses of RF/EMF radiation sources. Approvals may be subject to restrictions imposed by the Committee. The Committee has the right to suspend approvals if the requirements of the approval are not complied with. The Committee may designate a person or persons to give approval for routine requests. The RSC Chairman may act on behalf of the RSC as necessary. All actions shall be reported to the RSC at the next meeting. The RSC consists of representatives from various directorates with varying areas of expertise. The RSC shall:

- Be chaired by an individual designated by the Chief, Safety and Environmental (S&E) Division;
- Meet as often as necessary to accomplish its responsibilities and as a minimum shall meet quarterly;
- Ensure the development and maintenance of GSFC Non-ionizing Radiation Protection Program policies on behalf of the Center Director and the SMC;
- Review and approve uses of controlled non-ionizing radiation devices;
- Advise the Radiation Protection Officer (RPO) in the execution of duties; and
- Provide oversight of GSFC radiological regulatory matters.

## 1.3 S&E Division

S&E staff has responsibility for RF/EMF radiation protection at GSFC and shall:

- Provide consultation and support to all GSFC organizations; and
- Designate the Non-ionizing Radiation Protection Officer (NRPO) for the Greenbelt campus.

## 1.4 Wallops Flight Facility (WFF) Safety Office

WFF Safety Office shall designate a Non-ionizing Radiation Protection Officer (NRPO) who shall provide review and preliminary approval for RF/EMF activities at or managed by WFF. The WFF NRPO shall provide a list of preliminary approvals that have been granted at the quarterly RSC meetings. The WFF Safety Office shall be the office of record for all documents and use programs to assure compliance with RSC requirements relating to RF/EMF radiation at that facility.

## 1.5 Radiation Protection Officer (RPO)

The RPO or NRPO shall

- Act as liaison officer for the GSFC Radiation Protection Program to ensure compliance with the applicable regulatory agencies' requirements relative to all non-ionizing radiation-related activities and regulatory matters for GSFC;
- Provide technical guidance to GSFC organizations on non-ionizing radiation related matters and act as the functional representative of the RSC;

- c. Audit the recordkeeping systems of the Non-ionizing Radiation Protection Program for GSFC pertinent to applicable requirements for licenses, registrations, and reports;
- d. Assume technical control, initiate investigations, and direct corrective actions in non-ionizing radiation incidents and emergencies for GSFC and coordinate mishap reporting and investigation requirements;
- e. Assure proper disposition of non-ionizing radiation records for all employees, both Government and contractor, upon their termination of employment or transfer;
- f. Make interim approvals for the RSC, subject to subsequent RSC ratification;
- g. Implement the Non-ionizing Radiation Protection Program;
- h. Provide general surveillance functions for the GSFC Non-ionizing Radiation Protection Program;
- i. Provide technical evaluation of proposed uses of non-ionizing radiation, make recommendations, and provide other assistance to the RSC on matters concerning non-ionizing radiation protection;
- j. Perform onsite surveillance, inspections, surveys, or monitoring of non-ionizing radiation uses and users, as required;
- k. Provide health and safety analysis of planned RF systems; and
- l. Survey RF systems with RF exclusion areas annually.

## **1.6 Custodians**

The custodian shall assure that only appropriately trained users operate the sources or devices, and ensure appropriate controls are developed for systems where potential exposures exceed permissible levels.

## **1.7 Users**

Any employee or contractor subject to these requirements involved in radiological activities shall know and observe GSFC radiological safety regulations. They shall immediately report to their supervisor all unsafe conditions or operations involving radiation emitting sources or devices.

## **2. REQUIREMENTS**

The provisions and guidelines in this section are provided to help users comply with GSFC requirements as well as those of other regulatory agencies as they apply to NASA-directed operations at GSFC.

### **2.1 GSFC-Required Authorizations and Provisions**

Unless specifically exempted by the provisions of paragraph 3.1 or by GSFC RPO/WFF NRPO direct action, GSFC Form 23-6RF Use Approval is required for any RF/microwave radiation device operating at frequencies between 3kHz and 300 GHz, including but not limited to:

- a. Radar systems;
- b. Spacecraft and vehicle telemetry and communications systems;
- c. Earth stations;
- d. Microwave diathermy units; and
- e. Radio frequency (RF) generators.

WFF users are authorized to use the GSFC Form 23-6RF Use Approval or a WFF equivalent.

2.1.1 Individual users and use organizations shall ensure accountability for their sources and coordinate this effort with the GSFC RPO, or designated representative.

2.1.2 Radiation Controlled Areas and Exclusion Areas, as described by the applicable Use Authorization, shall be posted and controlled by the user. Warning signs and labels described by this GPR or their equivalent shall be utilized in all area postings. The following criteria shall be used to determine the category of an area:

- a. **Exclusion Area** locations are where the exposure limits are exceeded during normal operation and controls such as lock out/ tag out are required to protect personnel.
- b. **Occupational/controlled** areas apply to situations in which persons are exposed as a consequence of their employment and in which those persons who are exposed have been made fully aware of the potential for exposure and can exercise control over their exposure. Occupational/controlled exposure limits also apply where exposure is of a transient nature as a result of incidental passage through a location where exposure levels may be above general population/uncontrolled limits (see below), as long as the exposed person has been made fully aware of the potential for exposure and can exercise control over his or her exposure by leaving the area or by some other appropriate means.
- c. **General population/uncontrolled** areas apply to situations in which the general public may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Therefore, members of the general public would always be considered under this category when exposure is not employment-related, for example, in the case of a telecommunications tower that exposes persons in a nearby residential area. For purposes of applying these definitions, awareness of the potential for RF exposure in a workplace or similar environment can be provided through specific training as part of an RF safety program. Warning signs and labels can also be used to establish such awareness as long as they provide information, in a prominent manner, on risk of potential exposure and instructions on methods to minimize such exposure risk. However, warning labels placed on low-power consumer devices such as cellular telephones are not considered sufficient to achieve the awareness necessary to qualify these devices as operating under the occupational/controlled category. In those situations the general population/uncontrolled exposure limits shall apply.

2.1.3 All personnel exposure to RF/microwave radiation devices on GSFC shall be kept As Low As Reasonably Achievable (ALARA)

2.1.4 Any RF/microwave radiation device improperly transported onto GSFC will be subject to impoundment until either the irregularities are corrected and appropriate GSFC authorizations are obtained or removal from GSFC is arranged.

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2.1.5 Noncompliance with GSFC Non-ionizing Radiation Protection Program requirements relative to the authorized use of RF/microwave radiation devices shall result in the revocation or suspension of such use authorization, and impoundment of radiation devices.

## 2.2 Data Submittals and Approvals

GSFC Non-ionizing Radiation Protection Program authorization for the possession or use of controlled RF/microwave radiation devices requires submittal of the appropriate completed GSFC Non-ionizing Radiation Protection Program form(s) for the device(s), together with any supportive data required. Submittals shall be made as soon as practicable, but in no case later than 90 days (unless otherwise specified) prior to the intended arrival of the radiation devices. Appropriate GSFC forms required for RF/microwave radiation devices and associated data submittal requirements for GSFC Non-ionizing Radiation Protection Program authorization are described in this section.

## 2.3 Radio Frequency and Microwave Systems

### NRPO/RPO Evaluation Requirements

For all sources of RF/EMF the custodian of the device shall prepare a GSFC Form 23-28RF and submit it to the NRPO/RPO for review and evaluation. The NRPO/RPO shall determine if potential for hazardous radiation exists. This evaluation shall include the hazards to personnel, electro-explosive devices (EED) and fuel systems. The personnel hazard evaluation shall be based on the limits established by ANSI and the American Conference of Industrial Hygienists (ACGIH) Threshold Limit Values (TLVs) for Chemical Substances and Physical Agents and Biological Exposure Indices (BEIs), latest edition.. The EED evaluation shall compare the field strengths generated with the worst-case device sensitivity/lead configuration. When mainbeam peak power densities exceed  $5000 \text{ mW/cm}^2$ , fuel-handling operations shall be evaluated for potential fire/explosion hazards.

## 2.4 User Personnel Identification

Each identified user/operator shall complete and submit to the NRPO/RPO GSFC Form 23-35RF along with the appropriate Use Request/Authorization form. The Use Supervisor/Custodian proposed for possession and use of the specified RF/microwave radiation device shall do likewise.

## 2.5 Specific Data Submittal Requirements

- Certain information shall be submitted in support of a request for use of radio frequency/microwave radiation devices at GSFC. All documentation for initial use requests shall be submitted as a single complete copy of the submittal package;
- Copies of appropriate Use Request/Authorization forms (GSFC Form 23-6RF) for use of RF/microwave radiation devices related to cargo or payloads shall be included in any safety review documentation associated with the payload/cargo that is provided prior to arrival of sources;
- Request for use of RF/microwave devices at GSFC shall be submitted to the GSFC RPO/WFF NRPO, as early as practicable, but in no case later than 90 days prior to projected receipt of the device(s) at GSFC; and



- d. Elements of a complete data submittal package for Use Authorization include, but are not limited to, those described below:
- (1) The appropriate GSFC Non-ionizing Radiation Protection Program Use Request/Authorization form as described in paragraph 2.3;
  - (2) Licenses or other appropriate registrations possessed by the user organization to own, maintain, and use the specific radiation device;
  - (3) All applicable operating, maintenance, and emergency procedures relating to possession and use of the radiation device(s) for which authorization is being requested;
  - (4) A listing, by full name of all proposed user/operator personnel, accompanied by a completed GSFC Form 23-35RF for each individual identified; and
  - (5) Approximate dates of arrival and departure of the specified radiation device(s) to and from GSFC, and mission or payload designation.

### **3. PROGRAM EXEMPTIONS**

A variety of commercially available consumer, business, and industrial application RF/microwave radiation devices are exempted from the authorization requirements of the Non-ionizing Radiation Protection Program because of their common usage and negligible potential for hazardous exposure under conditions of normal use. However, such exemption is valid only when certain conditions are met. The conditions listed below shall be met for exempted items. Individuals should consult with the GSFC RPO/WFF NPRO, if there is a question regarding applicability of program exemption to their particular situation or requirement.

#### **3.1 Exempted Item Categories**

The following general categories of radio frequency/microwave radiation devices are exempted:

- a. Devices for voice communication with transmitter power of 7 watts or less and an antenna gain of unity (walkie-talkies, car phones, cellular phones), at frequencies between 100 kHz and 450 MHz;
- b. Speed monitoring devices (radar guns);
- c. Automotive radar detectors;
- d. Microwave ovens designed for home use;
- e. RF/microwave radiation devices designed for and operated in a completely enclosed configuration where no open-air transmission is possible;
- f. RF/microwave radiation devices designed to operate in a hard-lined, closed loop configuration where no open air transmission is possible; and
- g. Devices or systems which have been shown by documented worst case analysis that they are incapable of emitting radiation levels greater than one half (50%) of current applicable maximum permissible exposures levels.

#### **3.2 Basis for Exemption of Sources**

Exemptions are valid for the general categories of equipment, instruments, and systems identified by paragraph 3.1 of this section provided that:



- a. The individual item is maintained in its original design configuration and utilized for its originally intended use over the useful life of the item;
- b. The design and manufacture of the item is in accordance with the specifications of the Federal Performance Standard for Electronic Products (Title 21, CFR, Part 1010);
- c. The item is operated in accordance with the manufacturer's recommended operating procedures; and
- d. Maintenance, service, or repair activities which could expose personnel to accessible levels of radiation equal to or greater than the levels described or implied in IEEE C95.1 shall be performed only by appropriately authorized and qualified personnel.

### **3.3 General Precautions for Exempted Items**

#### **3.3.1 Associated hazards**

Exemption of radiation devices from the authorization requirements of the GSFC Non-ionizing Radiation Protection Program shall not be construed to exempt the user from other safety requirements relating to potential hazards associated with operation of the item, such as, electrical hazards.

#### **3.3.2 ALARA**

Notwithstanding the negligible potential non-ionizing radiation hazard characteristically represented by exempted sources, users shall avoid:

- a. Close or prolonged exposure to emissions of devices, and
- b. Intrabeam exposure conditions of any duration.

## **4. RADIATION PROTECTION CONTROLS FOR RF/MICROWAVE SYSTEMS**

### **4.1 General Considerations**

- a. Radiation protection controls shall be devised to reduce the possibility of exposure of personnel to hazardous levels of RF/microwave radiation and to other hazards associated with the operation of RF/microwave devices during normal operation and maintenance;
- b. For all uses of RF/microwave systems, it is recommended the minimum level of RF/microwave radiation required for the application be utilized;
- c. RF/microwave transmitter beam height shall be maintained at a level not to intercept occupied facilities/structures and/or personnel within the identified hazard distance;
- d. Engineering control measures (items incorporated into the RF/microwave system installation by design) shall be given primary consideration for limiting access to RF radiation; and
- e. If engineering controls are impractical or inadequate, administrative and procedural controls and protective equipment shall be used to limit access to RF radiation.

### **4.2 Applicability of Control Measures**

- a. The purpose of control measures is to limit the possibility of exposure of personnel to hazardous levels of RF/microwave radiation and to associated hazards;

- b. Whenever the application of any one or more control measures reduces the possible exposure to a level at or below the applicable Permissible Exposure Limit (PEL), the application of additional controls for the same purpose is not required;
- c. Control measures described by this guideline and the applicable GSFC Use Authorization shall apply at all times when an RF/microwave system is in its operational and maintenance modes; and
- d. If, during periods of service to a RF/microwave system, the calculated level of accessible radiation exceeds the applicable PEL, the applicable control measures shall be instituted on a temporary basis by the custodian/user until servicing is complete.

### **4.3 Substitution of Alternate Control Measures**

Engineering control measures described by paragraph 4.1 may, upon review and approval by the GSFC RPO, be replaced by procedural, administrative, or other alternate engineering controls that provide equivalent protection.

### **4.4 Engineering Controls**

#### **4.4.1 Service Access Panels**

- a. Access panels to high voltage cabinets for RF/microwave systems are intended to be opened only by service personnel. These cabinets are designed to limit exposure to ionizing radiation generated from the high-voltages and to prevent direct access to high-voltage components. These panels shall either:
  - (1) Be equipped with an interlock; or
  - (2) Require a tool for removal and shall have an appropriate warning label on the panel.
- b. If the interlock can be bypassed or defeated, a warning label shall be located on or near the interlock.

#### **4.4.2 Antenna Stops**

Mechanical and/or electrical antenna azimuth and elevation stops shall be utilized to inhibit movement of the transmitting antenna beyond established azimuth and elevation guidelines.

#### **4.4.3 Antenna Activation Warning Systems**

When required by the provisions of the applicable GSFC Use Authorization, a blue rotating light shall be installed near the antenna site and activated when the RF system is transmitting. A sign explaining the purpose of the blue rotating light shall be posted adjacent to the light. Antennas that have a rotating or movement component should be equipped with a red light to warn persons in the area that the antenna will be in motion.

### **4.5 Administrative and Procedural Controls**

Administrative and procedural controls are methods or instructions that specify rules, or work practices, or both, that implement or supplement engineering controls and which may specify the use of personal protective equipment (PPE).

#### 4.5.1 Written Procedures

Written operating, maintenance, service, and emergency procedures shall be provided and maintained with the RF/microwave system for reference by operator, maintenance, and service personnel.

#### 4.5.2 Output Emission Limitations

The RF/microwave system custodian shall take such action as is necessary and approved by the NRPO/RPO to reduce levels of accessible power to that which is commensurate with the required application.

#### 4.5.3 Education and Training

Operators, maintenance, or service personnel shall have education and training commensurate with the level of potential hazard.

#### 4.5.4 Authorized Personnel

RF/microwave systems with accessible emission levels exceeding the appropriate Protection Guide (PG) (ANSI C95.1) shall be operated, maintained, and serviced by qualified and trained personnel.

#### 4.5.5 RF/Microwave Area Identification and Control

##### 4.5.5.1 RF/Microwave Radiation Control Area (RCA)

- a. The area shall be posted with the appropriate warning sign(s) as described by ANSI C95.2;
- b. The area shall be operated by and under the control of GSFC approved operator personnel;
- c. Untrained and unauthorized personnel shall be excluded from the RCA at all points where the appropriate PG is exceeded;
- d. Radiating antennas shall never be positioned in such a manner as to intercept occupied facilities/structures and/or personnel within the identified hazard zone;
- e. The RF/microwave beam path shall not exceed the established elevation and azimuth restrictions;
- f. The RF/microwave beam path shall be terminated when possible; and
- g. When the RF/microwave system is not being used, it shall be disabled in a manner to prevent unauthorized use.

#### 4.5.6 Warning Signs and Labels

##### 4.5.6.1 RF Warning Sign and Labels

RF warning signs and labels shall be utilized as described in ANSI C95.2, American National Standard Radio Frequency Radiation Hazard Warning Symbol.

#### 4.5.6.2 Inclusion of Pertinent Information

The inclusion and choice of warning information or precautionary instructions shall follow the guidelines of ANSI C95.2, unless otherwise specified by the GSFC Use Authorization.

#### 4.5.6.3 Display of Signs and Labels

All signs and labels shall be conspicuously displayed in locations where they will best serve to warn unauthorized personnel. The backs of doors shall not be used since the door may be propped open and hide the access warning signs.

#### 4.5.7 Suspected Overexposure to RF/Microwave Radiation

If it is suspected that someone has been overexposed to RF radiation (greater than the limits specified in ANSI C95.1), the custodian shall refer the exposed person to the medical clinic as stated in paragraph 4.7.1. The custodian or operator of the system shall immediately notify the NRPO/RPO of the suspected overexposure and document the conditions leading up to the incident.

### 4.6 Associated Hazards

In some RF/microwave applications, other associated hazards may require consideration. Associated hazards shall be evaluated and appropriate control measures taken by the RF user organization. Examples of associated hazards are provided here for consideration by the user organization.

- a. High-voltage sources and wiring shall be shielded;
- b. High-voltage equipment may produce x-radiation and require shielding;
- c. All electrical equipment shall be properly grounded; and
- d. Persons working with high-voltage energized equipment shall be trained in cardiopulmonary resuscitation.

### 4.7 Medical Surveillance Requirements

There currently are no routine medical surveillance requirements for users of extremely low frequency, radiofrequency, and microwave radiation systems. Suspected overexposures shall be immediately referred to the Health Unit (Greenbelt/WFF site) or local medical provider (off site) for evaluation.

## Appendix A – Training Requirements

1. For RF systems that cannot produce energy levels above the MPE the user/custodian shall:
  - a. Read and understand this directive; and
  - b. Follow the manufacturer's operating instructions.
2. For RF systems that produce energy levels above the MPE the user/custodian shall:
  - a. Read and follow guidance in this directive;
  - b. Follow the manufacturer's operating instructions;
  - c. Obtain at least 40 hours of OJT with the system; and
  - d. Complete a course of instruction which includes:
    - (1) Electromagnetic Spectrum (ionizing vs. non-ionizing);
    - (2) Health effects associated with RF energy; and
    - (3) Awareness in working with in RF environments.

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### CHANGE HISTORY LOG

Revision	Effective Date	Description of Changes
Baseline	02/15/05	Initial Release

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